UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,576	01/16/2004	Jian-Bing Fan	067234-0104	8734

41552 7590 10/26/2009

MCDERMOTT, WILL & EMERY
11682 EL CAMINO REAL
SUITE 400
SAN DIEGO, CA 92130-2047

EXAMINER	
FORMAN, BETTY J	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
10/26/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

SIP_Docket@mwe.com

Office Action Summary	Application No.	Applicant(s)	
	10/759,576	FAN ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6,8-10,14,16,25-28,31,33,37 and 39-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6,8-10,14,16,25-28,31,33,37 and 39-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 24 September 2009 in which claims 1, 28, 37, 39-40 and 48-50 were amended. The amendments have been thoroughly reviewed and entered.

The previous rejections in the Office Action dated 24 March 2009 are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed but are deemed moot in view of the amendments, withdrawn rejections and new grounds for rejection. New grounds for rejection, necessitated by the amendments, are discussed.

Claims 1, 4, 6, 8-10, 14, 16, 25-28, 31, 33, 37 and 39-50 are under prosecution.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 4, 6, 8-10, 14, 16, 25-28, 31, 33, 37 and 39-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims have been amended to define microspheres comprising "at least

100 different target analytes"; "at least 1,000 different target analytes"; "at least 10,000 different target analytes"; and "at least 100,000 different target analytes".

Applicant points to ¶ 55 for support of the newly defined microspheres. The cited passage is provided below:

> The size of the target analyte set will vary with the assay being done and the desired information. For example, from 2 to 100,000 different target analytes may make up a set. That is, when beads are used, each bead can comprise from 2 to 100,000 different target analytes, with from 10 to 10,000 being particularly preferred and from 100 to 1000 being especially preferred.

The passage defines 3 different ranges of target analytes on the microspheres i.e. 2-100,00, 10-10,000 and 100-1,000. The claims, as amended, define microspheres having an unlimited number of target analytes of at least 100, 1,000 and 10,000. The unlimited number includes 10^8, 10^9 .... 10^{100} etc. Hence, the newly defined range of target analytes on the microspheres differs from that described in the originally filed specification. Therefore, the amendments introduce new matter in to the claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4, 6, 8-10, 14, 16, 25-28, 31, 33, 37 and 39-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shuber (U.S. Patent No. 5,571,676 issued 5 November 1996) and Walt et al (U.S. Patent No. 6,327,410, filed 11 Sept 1998) in view of Drmanac et al (EP 0392546, published 17 October 1990) and Hornes et al (U.S. Patent No. 5,512,439, issued 30 April 1996) in view of

Regarding Claims 1, 28, 37, 39-40 and 48-50, Shuber teaches an array comprising a substrate having microspheres distributed on the substrate (i.e. microtiter plate, Column 11, line 24), a population of microspheres wherein a first microsphere has a plurality of different target analytes from a first individual and second microsphere has a plurality of different target analytes from a second individual (i.e. amplification products from 5 primers sets, Example 1, Column 10, line 53-Column 11, line 11 and lines 23-25). Shuber does not teach the microspheres also have identifier binding ligands for identifying the individuals.

Walt et al teach a similar array composition comprising a substrate having discrete sites and a population of microspheres comprising a first and second microsphere, each microsphere comprising a plurality of target analytes covalently attached (i.e. bioactive agents, column 11, lines 41-45, 57-67) wherein the first and second microsphere have analytes from a different target source (e.g. rabbit, goat, mouse, Column 27, lines 30-60) wherein the microspheres are each encoded with an identifier to identify the analyte (Fig. 3 and Column 27, lines 30-60) and wherein the microspheres are distributed on the surface (Column 4, lines 35-50).

Walt et al further teaches preferred target analytes are genomic DNA, cDNA or mRNA (Column 10, lines 38-42) and teaches the preferred embodiment wherein each microsphere has a single type of analyte (Column 11, lines 41-43). The preferred embodiment taught by Walt inherently teaches embodiments other than the preferred embodiment because "preferred" is a comparative term used to describe the embodiment relative to an alternative less-preferred embodiment.

However, Shuber teaches the embodiment wherein the microspheres have multiple analytes different analytes whereby multiple genomic regions relative to cystic fibrosis are amplified and immobilized onto microsphere for simultaneous analysis of the disease-causing gene sequences (Examples 1-5 and Claims 17-18).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the microspheres of Shuber comprising multiple and different analytes to the microsphere array of Walt. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the expected benefit of simultaneous analysis of disease-causing gene sequences as desired in the art (Shuber, Column 9, lines 18-39).

Alternatively, It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the microspheres of Shuber by adding the identifiers of Walt (Column 4, lines 48-58) thereby providing a fast and inexpensive process for making and using the array. One of ordinary skill in the art would have been motivated to do so with a reasonable expectation of success and for the benefit of fast

and inexpensive manufacture and use of the array as taught by Walt (Column 4, lines 53-55).

Furthermore, Drmanac teaches a similar composition comprising a first and second microsphere (discrete particle, (DP)), each comprising amplification product from fragmented genomic DNA, thus teaching different analytes on each DP (column 12 and column 13, lines 14-19) and labeled with an identifier binding ligands (Column 13, line 23-60).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the microspheres of Shuber and/or Walt et al by attaching the genomic fragments encoded by identifier oligos as taught by Drmanac. One of ordinary skill in the art would have been motivated to do so for the expected benefit of low cost and high throughput sequence determination as taught by Drmanac (Abstract and Column 1, lines 26-32). It would have been further obvious to one of ordinary skill to encode the microspheres of Shuber and/or Walt with the identifier binding ligands of Drmanac for the expected benefit of fast and frugal data generation (Column 4, lines 33-38).

Shuber teaches the microspheres are used for mRNA analysis via reverse transcription (Column 10, lines 9-14). Walt also teaches preferred target analytes are cDNA or mRNA (Column 10, lines 38-42). Shuber and Walt do not each 100, 1,000 or 10,000 different analytes on the microspheres. However, microspheres for mRNA analysis via reverse transcription having 10,000 different mRNA sequences were well known in the art at the time the invention was made as taught by Hornes (Column 5,

lines 11-14 and Examples 5-6, e.g. Column 17, lines 35-36). Hornes teaches the microspheres having oligo-dT probes selectively isolate mRNA from cell lysate for subsequent analysis e.g. reverse transcription (Column 6, lines 47-67)

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the oligo-dT microspheres of Hornes to the microsphere arrays of Shuber and/or Walt. One of ordinary skill in the art would have been motivated to do so, with a reasonable expectation of success based on the teaching of Hornes. The artisan would have been further motivated to do so based on the expressed interest in mRNA analysis of Shuber and Walt and for the added benefit of efficient purification of the mRNA for subsequent analysis as taught by Hornes (Column 5, lines 64-65).

Regarding Claims 4 and 31, Drmanac teaches the identifier binding ligands are nucleic acids (Column 7, line 51-Column 8, line 17).

Regarding Claims 6, 33, 42, 45, Shuber teach the array wherein the analytes are genomic DNA (Abstract, Example 1). Walt et al also teach the analytes are genomic DNA (Column 10, line 31). And Drmanac teaches the array wherein the analytes are genomic DNA (Abstract).

Regarding Claim 8, Walt et al disclose the array wherein the substrate is a fiber optic (Column 5, lines 24-31).

Regarding Claim 9, Shuber teaches the array wherein the substrate is plastic i.e. microtiter plate (Column 11, line 24). Walt et al disclose the array wherein the substrate is plastic (Column 5, lines 37-40).

Regarding Claim 10, Shuber teaches the array wherein the substrate has wells i.e. microtiter plate (Column 11, line 24). Walt et al disclose the array wherein the discrete sites are wells (Column 5, lines 61-67).

Regarding Claim 14, Walt et al teach the array wherein the surface comprises about 10,000 to 100,000,000 per cm^2 the discrete sites Column 5, lines 4-31).

Regarding Claims 16 and 47, Walt et al teach the array wherein the analytes are covalently attached to microspheres (Column 11, lines 63-64).

Regarding Claim 25, Walt et al disclose the composition wherein the surface comprises about 100,000 to 10,000,000 per cm^2 discrete sites (Column 5, lines 4-31).

Regarding Claim 26, Walt et al disclose the composition wherein the surface comprises about 10,000,000 to 1,000,000,000 per cm^2 discrete sites (Column 5, lines 5-31).

Regarding Claim 27, Walt et al disclose the composition wherein the surface comprises about 10,000 to 100,000 per cm^2 discrete sites (Column 5, lines 4-31).

Regarding Claims 37 and 48, Shuber teaches the array wherein the different analytes are amplification product using 5 different primer pairs, thereby producing at least 2 different analytes (Column 10, lines 53-67) And Drmanac teaches a similar composition comprising a first and second microsphere (discrete particle, (DP)), each

comprising amplification product from fragmented genomic DNA, thus teaching different analytes on each DP (column 12 and column 13, lines 14-19).

Regarding Claims 39 and 49, Shuber teaches the array wherein the different analytes are amplification product using 5 different primer pairs, thereby producing at least 10 different analytes (Column 10, lines 53-67).

Regarding Claims 41 and 44, Shuber teaches the array wherein the microspheres are distributed on the surface (Column 11, line 24). Walt et al teach the array wherein the microspheres are distributed on the surface (Column 4, lines 35-50). And Drmanac teaches the array wherein microspheres are distributed on the surface (column 7, lines 27-29).

Regarding Claims 43, 46, Shuber teach the array wherein the analytes are single stranded nucleic acids (i.e. denatured prior to hybridization, Column 11, lines 29-31). And Drmanac teaches the array wherein the nucleic acids are denatured prior to hybridization (Column 18, lines 45-58).

Conclusion

6. No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Nguyen can be reached on (571) 272-0731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BJ Forman
Primary Examiner
Art Unit 1634

/BJ Forman/
Primary Examiner, Art Unit 1634